WHAT IS CLAIMED IS:

1/ A method of diagnosing a fault on a transformer winding, the method comprising the following steps:

    · measuring the impedance on said winding as a function of frequency, said measurement being represented in the form of a first voltage gain;

    · comparing said impedance measurement with a reference measurement represented in the form of a second voltage gain, said comparison including a step of calculating three first parameters, each of said three first parameters being a correlation coefficient, between said first and second gains over three different frequency ranges;

    said method comprising a step of determining the relative variation of at least a fourth parameter, said fourth parameter being a physical magnitude characteristic of said transformer, said relative variation being obtained by comparing said first and second gains.

2/ A method according to claim 1, wherein said fourth parameter is selected from minimum gain, fundamental resonant frequency, and number of resonant frequencies present above a predetermined frequency.

3/ A method according to claim 2, wherein said minimum gain is determined for a frequency below 10 kHz.

4/ A method according to claim 1, wherein said three different frequency ranges are respectively: [1 kHz to 10 kHz], [10 kHz to 100 kHz], and [100 kHz to 1 MHz].

5/ A method according to claim 1, including a step of determining the relative variation of at least a fifth parameter and a sixth parameter, said fifth and sixth

parameters being characteristics of said transformer, said relative variation being obtained by comparing said first and second gains.

5 6/ A method according to claim 5, wherein said fourth parameter is minimum gain, said fifth parameter is fundamental resonant frequency, and said sixth parameter is number of resonant frequencies present above a predetermined frequency.

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7/ A method according to claim 1, including a step of determining a plurality of diagnosis codes, each of said codes indicating whether a respective one of said parameters belongs to a predetermined range of values.

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8/ A method according to claim 7, including a step of determining the presence of a fault and of identifying said fault as a function of said plurality of diagnosis codes.

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9/ A method according to claim 8, wherein said step of determining the presence of a fault and of identifying said fault is performed by comparing said plurality of codes with codes stored in a search table.